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Search Results -

Terms	Documents
L6 and (("line-scan" or (line$ adj2 scan$)) near4 (imag$ or camera)) same ((mobile$ or handheld or portable or moving) same (collect$ or record$))	50

Database:
US Pre-Grant Publication Full-Text Database
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Search History

DATE: Sunday, June 03, 2007 Purge Queries Printable Copy Create Case

Set Name side by side	Query	Hit Count	Set Name result set
	DB=PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD; THES=ASSIGNEE; PLUR=YES; OP=OR		
L19	L6 and (("line-scan" or (line$ adj2 scan$)) near4 (imag$ or camera)) same ((mobile$ or handheld or portable or moving) same (collect$ or record$))	50	L19
L18	L16 and ((mobile$ or handheld or portable or moving) same (collect$ or record$))	263	L18
L17	L16 and ((mobile$ or handheld or portable or moving) and (collect$ or record$))	297	L17
L16	L6 and (("line-scan" or (line$ adj2 scan$)) near4 (imag$ or camera))	300	L16
L15	l13 and L14	1	L15
L14	L7 and (("line-scan" or (line$ adj2 scan$)) near4 (imag$ or camera))	1	L14

L28: Entry 1 of 1 File: USPT Jul 20, 2004

DOCUMENT-IDENTIFIER: US 6766038 B1
TITLE: Apparatus and method for image processing

Abstract Text (1):
The method for measuring speed is performed by dividing the time sequence image data A into long and narrow frames (step 401). Next, the framed images and the time sequence image data B produced by the line scan camera B are correlated to obtain a moving time (step 402). Next, a moving time of each framed image and a corresponding moving distance are obtained to compute a moving speed (step 403). Next, scale of a specific shape pattern and the like is corrected using the moving speed obtained to match the scales in the two image sequences A and B to obtain a similarity degree (step 404). Next, a threshold value is applied to the similarity degree to recognize the specific shape pattern, thereby recognizing that the images are produced by a moving vehicle.

Brief Summary Text (3):
The present invention relates a method for measuring the length and a relative moving speed of an object moving with respect to a point of observation from time sequence image data produced by using line scan cameras and the like, and a pattern recognition method and apparatus based on the resulting image data.

Brief Summary Text (6):
On the other hand, the following references are examples of the method for determining the speed and length of a moving object from images. "Traffic flow measurements using the double slit method" (reference 1, Road Traffic and Automobiles, The Institute of Electrical Engineers of Japan, Vol. RTA94-5, 1994) and "Traffic flow measurements using the double slit camera" (reference 2, The Institute of Electronics Engineers of Japan, Vol.26, No.3, 1997). These methods are based on providing imaginary slits within the images recorded using a general purpose video-camera and obtaining spatial time images by linking the images between the slits. Two slits are placed in the images, so that the moving speed and the length of the object are measured by obtaining the time interval for the object to pass through the two slits.

Brief Summary Text (9):
In the meantime, according to conventional video images, because the two slit planes are not parallel, the depth of field must be fixed first, so that the distance of movement between the actual slits can be determined separately. Also, the general purpose video camera can only record at 30 frames/second, so that if the object is moving at high speeds, it is not possible to produce precision measurement of speed. Also, there is no known method of measuring the relative speed of an object using the images taken by placing a camera on another moving object.

Brief Summary Text (19):
Also, in the present invention, there is no need for placing line image recording apparatus (line scanning camera and the like) to surround the object, and therefore, the arrangement of the apparatuses is facilitated compared with

using two units of line scan cameras.

Detailed Description Text (26):
so that the time scales can be matched in the two image data. In the meantime, the scale in the line axis direction can vary depending on how far object is from the line scan cameras A recording the object. Therefore, the line scale of the template of the specific shape pattern in the line axis direction is increased or decreased to match the scales in the two images. After which, the degree of similarity is obtained by computing the difference value or correlation coefficient (refer to reference 3), and when a higher degree of similarity than a certain value of similarity is obtained, it is considered that a match has been obtained. In this embodiment, the template for the specific shape pattern was corrected to match the time scales, it is permissible to correct the time sequence image data, or to correct both the template and the time sequence image data.

Detailed Description Text (27):
Next, the pattern is recognized using the degree of similarity, and the stationary vehicle is recognized (step 406). By applying the threshold processing technique to the degree of similarity obtained in step 405, the wheel represented by the specific shape pattern is recognized. Therefore, if a wheel is detected within the time sequence image data, it means that the stationary object is a stationary vehicle. Accordingly, a stationary object can be recognized using the time sequence image data produced from the two line scan cameras.

Detailed Description Text (30):
Measurements of speed and length, a method for recognizing a pattern and embodied examples of the apparatus in Embodiment 2 will be explained in the following. In this embodiment, a measuring point having two units of line scan cameras, as an example of a plurality of line scan cameras, are disposed in a fixed point of observation to perform speed and length measurements and pattern recognition of vehicles moving along a given track. The measuring apparatus used in this embodiment is the same as the one used in Embodiment 1 (refer to FIG. 1).

Detailed Description Text (31):
FIG. 7 shows an example of the apparatus for performing speed and length measurements and pattern recognition in Embodiment 2, and 701 refers to a moving vehicle; 702 to a line scan camera A; 703 to a line scan camera B, 704 to a measuring apparatus.

Detailed Description Text (32):
FIG. 8 shows a top view of the measuring system shown in FIG. 7, and 801 refers to a moving vehicle; 802 to the moving direction; 803 to a line scan camera A; 804 to a line scan camera B; 805 to an angle .theta.; 806 to a line axes separation distance L; and 807 to a moving distance Lr. The moving direction of the moving vehicle 801 is defined as the moving direction 802, and the line scan camera A803 and the line scan camera B804 are disposed at an angle .theta. with respect to the moving direction 802. In this arrangement, the true distance Lr807 of the vehicle moving along the given track between the line axes is given the expression below.

Detailed Description Text (35):
First, an image pattern that includes the moving vehicle 801 is extracted from time sequence images 911, 913 recorded at a given scanning timing using the line scan camera A803 synchronized to the line scan camera B804 (step 901). Images without the moving vehicles are recorded beforehand using the line scan camera A803 and the line scan camera B804, and are accumulated in the image accumulation section 107 as background image A912 and B914.

Detailed Description Text (36):
FIG. 10 shows examples of the time sequence image data recorded by the line scan cameras, and 1001 refers to time sequence image data A recorded by the line scan

by synchronizing the two cameras at a constant timing determined by a line scanning cycle.

Detailed Description Text (7):
The line scan cameras used in this embodiment are a monochromatic cameras having 8-bit pixels of 256 gradations each, and the number of pixels comprising each line is 2024 pixels and each line is scanned at a cycling time of 100 .mu.s.

Detailed Description Text (8):
FIG. 2 shows a measurement method, a pattern recognition method and an example of a measurement system using the measuring apparatus, and 201 represents a stationary vehicle 1; 202a stationary vehicle 2; 203a moving vehicle; 204 the moving direction; 205 a line scan camera A installed on the moving vehicle 203; and 206 a line scan camera B installed on the moving vehicle 203.

Detailed Description Text (9):
FIG. 3 is a top view of the measuring system shown in FIG. 2, and 301 represents the moving vehicle; 302 the moving direction; 303a line scan camera A; 304a line scan camera B; 305 an angle .theta.; 306 a distance L between the line axes (line axes spacing distance L); 307a moving distance Lr of the moving vehicle; 308 a stationary vehicle 1; and 309 a stationary vehicle 2. The direction of the moving vehicle 301 is designated by 302, and it is assumed that the line scan camera A303 and the line scan camera B304 are inclined at an angle .theta. 305 with respect to the moving direction 302. Then, the actual moving distance Lr 307 of the stationary vehicle between the line axes is obtained by an expression:

Detailed Description Text (12):
First, time sequence image data A411 recorded by the line scan camera A303 are divided into long frames having a narrow width (step 401). FIG. 5 shows an example of the time sequence image data and the framed images, and 501 refers to the time sequence image data A recorded by the line scan camera A, 502 refers to time sequence image data B recorded by the line scan camera B, 503 to a narrow rectangular framed image in the data A501, 504 to a matched region found in the data B302, 505 to a frame width W and 506 to a moving time interval Tv. Here, it is preferable that the number of lines along the time axis of a framed image be about 10.about.20 lines, and since the number of pixels per line is 2,048, the number of pixels in one framed image is about 20,480.about.40,960.

Detailed Description Text (13):
Next, the framed image 503 is correlated with the time sequence image data B412 recorded by the line scan camera B304, and a size of a respective time displacement 506 of the object is computed (step 402). It can be seen in FIG. 5 that the stationary vehicle crosses the viewing front of the line scan camera B304 before that of the line scan camera A303, so that the image region 504 in the time sequence image data B that matched the framed image 503 is found near the beginning portion of the time axis 507. Therefore, the degree of similarity is obtained by restricting the search to only the negative direction on the time axis 507 to compute the difference value and the correlation coefficient (refer to reference 3, "Image Processing Handbook", Shokodo, 1987) to find the matched region 504 to compute a size of the time displacement 506 of the object.

Detailed Description Text (19):
Next, using the time interval of the framed images and the corresponding moving distance, a moving speed is obtained (step 403). Specifically, the time displacement, in other words, the moving time interval Tv is obtained from the following expression using the number of moving pixels P and the recording time interval Tc of the line scan camera.

Detailed Description Text (22):
As described above, it is possible to determine a moving speed of an object by

obtain chronological change 1602 in the amount of image change. Designating the number of pixels in one line by m, the brightness of each point in the line at time t by I(t, i), and the line scanning interval by t.sub.0, the above-mentioned chronological change e(t) is given by the following expression. ##EQU3##

Detailed Description Text (52):
Threshold processing of the amount of change using the threshold value 1604 enables to determine an image change point 1603. Similar processing is performed on the time sequence image data B1512 recorded by the line scan camera B to obtain an image change point.

Detailed Description Text (53):
Next, the image change points are correlated and the time displacement values are computed. As in this embodiment, when the moving direction of the moving vehicle is given, the object crosses the line scan camera A first and then the line scan camera B next. Therefore, an image change point is detected in the time sequence image data A, and an image change point obtained immediately afterward from the time sequence image data B can be designated as the starting point of the image pattern of the moving vehicle. Even when the moving direction of the vehicle is unknown, an image change point nearby can be designated as the starting point or an ending point of the image pattern of the moving vehicle. When the correlation is completed, moving velocity of the moving object can be computed from the moving time interval and the actual distance of move as in Embodiment 2.

Detailed Description Text (56):
Measurements of speed, length and a method recognizing a pattern and embodied examples of the apparatus in Embodiment 3 will be explained in the following. In this embodiment, a measuring point having two units of line scan cameras, as an example of a plurality of line scan cameras, which are disposed in a fixed point of observation to perform speed and pattern recognition of moving vehicles. The measuring apparatus used in this embodiment is the same as the one used in Embodiments 2, 3 (refer to FIGS. 7, 8).

Detailed Description Text (59):
FIG. 18 shows an example of the chronological change in the amount of image change between the time sequence image data and the background image, and 1801 refers to the time sequence image data A recorded by the line scan camera A; 1802 to a background image A; 1803 to a chronological change in the amount of image change from the background image; 1804 to an image change point (starting point); 1805 to an image change point (ending point); 1806 to a threshold value for the amount of change; and 1807 to the time axis. Because the observation point is fixed in this embodiment, when there is no moving object, there is hardly any chronological change in the image. On the other hand, a large change takes place in the image when the moving vehicle begins to pass. Therefore, by performing difference value computation or correlation coefficient computation (refer to reference 3), it is possible to obtain chronological change 1803 in the amount of image change. Threshold processing of the amount of change using the threshold value 1806 enables to determine an image change point (starting point) 1804 and an image change point (ending point) 1805. Similar processing is performed on the time sequence image data B1713 recorded by the line scan camera B to obtain an image change point.

Detailed Description Text (60):
Next, the image change points are correlated and the time displacement values are computed. In this embodiment, the starting point and the ending point of image change are considered as a combined pair of image change points. As in this embodiment, when the moving direction of the moving vehicle is given, the object crosses the line scan camera A first and then the line scan camera B next. Therefore, an image change point is detected in the time sequence image data A, and an image change point obtained immediately afterward from the time sequence image data B can be designated as the combined pair of starting point and the ending

camera A; 1002 to time sequence image data B recorded by the line scan camera B; 1003 to a background image A of the line scan camera A; 1004 to a background image B of the line scan camera B; and 1005 to the time axis. Background images A1003, B1004 are images having a width comprised by one line or several lines. Because the observation point is stationary in this embodiment, images such as those shown by time sequence image data A1001 and B1002 formed by the moving vehicle 801 superimposed on the contiguous background images are obtained. Therefore, by performing difference value computation involving the background image or correlation coefficient computation (refer to reference 3) for every one line of several lines, it is possible to perform threshold computation and labeling processing (refer to reference 3) using the values thus obtained, thereby enabling to extract regions different from the background, that is, an image pattern containing the moving object. However, the background images can change depending on the illumination conditions, and therefore, background images may in some cases be renewed as necessary. The foregoing expression (1) or (2) can be used to compute the above-mentioned difference value or correlation coefficient.

Detailed Description Text (39):
Next, the moving speed is obtained from the value of the time displacement of the image patterns and the corresponding moving distance (step 903). Specifically, the value of the time displacement, that is, the moving time interval Tv is obtained according to the number of moving pixels P of the image pattern in the time sequence image data and the recording time interval Tc of the line scan camera using the following expression.

Detailed Description Text (41):
As described above, it is possible to determine a moving speed of an object by using two units of line scan cameras.

Detailed Description Text (46):
Next, using the degree of similarity, the pattern is recognized and the moving vehicle is identified (step 906). Therefore, by applying the threshold processing technique to the degree of similarity obtained in step 905, the wheel represented by the specific shape pattern is recognized. Therefore, if a wheel is detected within time sequence image data, it means that the moving object is a moving vehicle. Accordingly, a moving object can be recognized using the time sequence image data produced from two line scan cameras.

Detailed Description Text (48):
Measurements of speed and a method for recognizing a pattern and embodied examples of the apparatus in Embodiment 3 will be explained in the following. In this embodiment, a measuring point having two units of line scan cameras, as an example of a plurality of line scan cameras, are disposed in a fixed point of observation to perform speed and pattern recognition of moving vehicles. The measuring apparatus used in this embodiment is the same as the one used in Embodiment 2 (refer to FIGS. 7, 8).

Detailed Description Text (51):
First, an image change point on the time axis is detected from the time sequence image data 1511, 1512 (step 1501). Here, the time sequence image data are obtained as in Embodiment 2. FIG. 16 shows a graph of an example of the chronological change in the time sequence image data, and 1601 refers to the time sequence image data A recorded by the line scan camera A; 1602 is graph to show the chronological change in the amount of change between two consecutive 1-line images; 1603 to an image change point; 1604 to a threshold value of the change; and 1605 to the time axis. Because the observation point is fixed in this embodiment, when there is no moving object, there is hardly any chronological change in the image. On the other hand, a large change takes place in the image when the moving vehicle begins to pass a detection point. Therefore, by performing difference value computation or correlation coefficient computation (refer to reference 3), it is possible to

conventional phototubes and the like. In contract to using the phototubes, image data of the object can be accumulated so that the object can be identified after the measurements.

Brief Summary Text (20):
Also, by using line image recording apparatus, it is possible to provide highspeed recording of a moving object at about 1000 times the speed of conventional video cameras, so that moving speed of a fast moving object can be determined. Unlike the case of using video cameras, many line image recording apparatuses can be positioned in parallel to enable speed measurements without being affected by problems related to the distance from the cameras.

Drawing Description Text (6):
FIG. 5 is an illustration of an example of the output image from a line scan camera in Embodiment 1.

Drawing Description Text (11):
FIG. 10 shows examples of the output images from line scan cameras in Embodiment 2.

Drawing Description Text (15):
FIG. 14 show side views of examples of the output images from a line scan camera in Embodiment 2.

Drawing Description Text (17):
FIG. 16 is an example of the output image from the line scan camera in Embodiment 3 and a graph showing the amount of change in the image.

Drawing Description Text (19):
FIG. 18 is an example of the output image from the line scan camera in Embodiment 4 and a graph showing the amount of change in the image.

Drawing Description Text (26):
FIG. 25 is an illustrated view of an example of the output from the line scan camera in Embodiment 5.

Drawing Description Text (28):
FIG. 27 is an example of the output image from the line scan camera in Embodiment 5 and a graph showing the amount of change in the image.

Detailed Description Text (5):
Speed measurements and pattern recognition method and embodied examples of the apparatus in Embodiment 1 will be explained. In this embodiment, two units of line scan cameras, as an example of a plurality of line scan cameras, are used in the system and are mounted on a moving vehicle to perform image processing so that the speed of the moving vehicle can be measured and the image of a stationary object represented by a stationary vehicle can be recognized. In other words, the relative speed of the object moving relatively to the system along a given track can be measured.

Detailed Description Text (6):
FIG. 1 shows an apparatus for performing the speed measurement and pattern recognition method in Embodiment 1. In to the information processing apparatus 101 shown in FIG. 1, a memory device 103, a display device 104 such as image monitor and a measuring device 105 are connected thereto through a bus line 102. The memory device 103 is provided, in its interior, with a measurement results accumulation section 106 and an image accumulation section 107. Also, inside the measuring device 105 are provided a line scan camera A108, a line scan camera B109 and a synchronizing device 110. In this case, the synchronizing device 110 is represented by a pulse generator. The time image data from the line scan cameras are recorded

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ART-UNIT: 264

PRIMARY-EXAMINER: Lee; Michael H.

ATTY-AGENT-FIRM: Banner & Witcoff, Ltd.

ABSTRACT:

A method for capturing and directly scanning a rectilinear imaging element using a non-linear scan is incorporated into a single chip comprising at least a sensor array and an MSD. The method directly addresses each picture element of an analog image captured with an imaging device having either a partial spherical field of view or a conventional two-dimensional field of view. An image transform processor is used to process the captured image depending upon the particular portion of interest of the image. In the case of a non-linear scan, the image transform processor is provided with the capability of geometrically filtering the portion of interest of the captured image such that a two-dimensional, undistorted image is displayed at the monitor. A CMOS active pixel image sensor (APS) or Charge Injection Diode (CID) camera array are used to capture the image to be scanned. The image transform processor of the present invention is a Mixed-signal Semiconductor Device (MSD). The image transform processor corrects any predetermined distortion introduced by the image sensor array.

17 Claims, 9 Drawing figures

point of the image pattern of the moving vehicle. Even when the moving direction of the vehicle is unknown, an image change point pair nearby can be designated as the starting point and an ending point of the image pattern of the moving vehicle. When the correlation is completed, moving velocity of the moving object can be computed from the moving time interval and the actual distance of move as in Embodiment 2.

Detailed Description Text (62):
In the above Embodiments 2, 3 and 4, the side view of the object was used, but as shown in FIGS. 19, 20, the method is applicable to a case of images recorded by the line scan cameras A1902, 2003 and the line scan cameras B1903, 2004 which are disposed on the upper section of the moving vehicles 1901, 2001. Also, as shown in FIGS. 21, 22, to accumulate the processing results, line scan cameras A2102, 2202 and the line scan camera A303 line scan cameras B2103, 2203 are synchronized with the area scan cameras 2104, 2204, and the stationary image and video images recorded by the moving objects (moving vehicles 2101, 2201) may be displayed or recorded. Also, two units of line scan cameras were used, but more than 2 units of line scan cameras may be provided.

Detailed Description Text (64):
Next, an application of the present method of speed measurement to a speeding vehicle monitoring system will be explained. In this embodiment, two units of line scanning cameras assigned to the respective observation points are fixed, and speed measurement of the moving vehicle and license plate recognition are performed.

Detailed Description Text (65):
FIG. 23 shows an example of the speeding vehicle monitoring system in the present embodiment. The line scan camera A3102, a line scan camera B3103 and an infrared illumination 3104 are disposed above the gantry so as to enable a speeding car to be recorded from above. The line axes of the line scan camera A3102 and the line scan camera B3103 are disposed parallel to each other, and are synchronized so as to record at a constant line scanning cycle. Also, the line scan camera A3102 and the line scan camera B3103 are each provided with a polarizing filter for suppressing scattered reflection from the front glass and to enable to record an image of the driver, as well as a visible light blocking filter (infrared transmissive filter) to enable to record the images any time of the day or night.

Detailed Description Text (66):
FIG. 24 shows a side view of the system shown in FIG. 23, and the line scan camera A3203 and the line scan camera B3204 and the infrared illumination 3208 are oriented downward at and angle .theta. with respect to the ground. In such a case, the moving distance Lr of the moving vehicle between the line scan camera A and the line scan camera B is given by the following relation.

Detailed Description Text (67):
FIG. 25 shows an example of the time sequence images obtained by the line scan camera A and the line scan camera B. As shown in this diagram, the apparatus is capable of recording a driver and a license plate by placing the line scan cameras so as to view from the top to the bottom.

Detailed Description Text (69):
First, time sequence images A produced by the line scan camera A and time sequence images produced by line scan camera B are obtained, and detect an image change point on the time axis from each time sequence image data (step 3401).

Detailed Description Text (71):
Next, image change points in time sequence images A and B are correlated to each other and moving time intervals are computed (step 3402). When the moving direction of the moving vehicle is already determined, the vehicle crosses the cameras in the order of line scan camera A and line scan camera B. Therefore, an image change point is detected from the time sequence image data A, and an image change point in

the time sequence image data B, that follows immediately the images in camera A, can be identified as the starting point. Therefore, the moving distance Lr between the two line scan cameras and the moving time Tv are as shown in FIG. 28.

Detailed Description Text (74):
FIG. 29 shows examples of the time sequence image data obtained from a fast moving vehicle and a slow moving vehicle. As shown in FIG. 29, the characters on the license plate are extended when the speed is low and are compressed when the speed is fast. Therefore, by dividing the time axis in each time sequence image data by the moving speed, the height of the characters on the license plate can be normalized. If the characters can be normalized, the license plate of the moving vehicle can be identified without being affected by the moving speed, using the conventional license plate recognition technique (refer to reference 4, Character Recognition in Scene Images, Society of Manufacturing Engineers, 1989) based on the degree of similarity. In the present example, because there are two image data from line scan camera A and line scan camera B for identification purposes, license plate can be checked against each image to improve the accuracy of identification.

Detailed Description Text (77):
It should be noted, in the explanations provided above, that reference numerals 108, 205, 303, 702, 803, 1202, 1303, 1902, 2003, 2102, 2202, 3102 refer to the same time sequence image data A. Similarly, reference numerals 109, 206, 304, 703, 804, 1203, 1304, 1903, 2004, 2103, 3303, 3103, 3204 refer to the same line scan camera B. Similarly, reference numerals 701, 801, 1201, 1301, 1901, 2001, 2101, 2201 refer to the object for measurement.

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FIELD-OF-CLASSIFICATION-SEARCH: 348/36, 348/43, 348/44, 348/39, 348/46, 348/147, 348/143, 348/315, 348/335, 348/340, 348/294, 348/311, 348/342, 348/91, 382/293, 382/295, 382/296, 382/297, 382/298, 395/137-139, 257/231, H04N 530, 700, 5225, 118, H04N005/30
See application file for complete search history.

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☐	4751660	June 1988	Hedley	364/518
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☐	4757384	July 1988	Nonweiler et al.	
☐	4772942	September 1988	Tuck	358/87
☐	4797562	January 1989	Dietrich	
☐	4797942	January 1989	Burt	382/41
☐	4807158	February 1989	Blanton et al.	

L33: Entry 5 of 7 File: USPT Jun 5, 2001

US-PAT-NO: 6243131
DOCUMENT-IDENTIFIER: US 6243131 B1

TITLE: Method for directly scanning a rectilinear imaging element using a non-linear scan

DATE-ISSUED: June 5, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Martin; H. Lee	Knoxville	TN		

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Interactive Pictures Corporation	Knoxville	TN			02

APPL-NO: 08/373446 [PALM]
DATE FILED: January 17, 1995

PARENT-CASE:
This application is a continuation-in-part of U.S. application Ser. No. 08/189,585 filed Jan. 31, 1994, now U.S. Pat. No. 5,384,588, which is a continuation-in-part of U.S. application Ser. No. 08/014,508 filed Feb. 8, 1993, now U.S. Pat. No. 5,359,363, which is a continuation-in-part of U.S. application Ser. No. 07/699,366 filed May 13, 1991, now U.S. Pat. No. 5,185,667.

INT-CL-ISSUED: [07] H04N 7/00, H04N 5/225

INT-CL-CURRENT:

TYPE	IPC	DATE
CIPS	G06 T 3/00	20060101
CIPS	H04 N 7/18	20060101
CIPS	H04 N 7/00	20060101
CIPN	A61 B 19/00	20060101
CIPS	G06 F 17/30	20060101
CIPS	G08 B 15/00	20060101
CIPS	H04 N 5/262	20060101
CIPS	H04 N 5/225	20060101
CIPS	H04 N 5/335	20060101
CIPS	H04 N 1/21	20060101

US-CL-ISSUED: 348/36; 348/207, 348/206, 348/147, 348/335, 382/293
US-CL-CURRENT: 348/36; 348/147, 348/206, 348/207.99, 348/335, 348/E5.03, 348/E5.055, 348/E5.091, 348/E7.087, 348/E7.091 , 382/293

L13	L12 and (("line-scan" or (line$ adj2 scan$)) near4 camera)	1	L13
L12	L11 and navigat$ and gps$	3	L12
L11	L4 and ((mobile$ or handheld or portable or moving) near3 (collect$ or record$)).clm.	481	L11
L10	L7 and L9	11	L10
L9	L8 and ((mobile$ or handheld or portable or moving) near3 (collect$ or record$))	11	L9
L8	L4 and navigat$ and gps$	126	L8
L7	L5 and navigat$ and gps$	11	L7
L6	L5 navigat$ and gps$	29157	L6
L5	L4 and ((mobile$ or handheld or portable or moving) near3 (collect$ or record$))	1638	L5
L4	L2 or L3	64450	L4
L3	(line$ with scan$ with (imag$ or camera)) and @pd<=20031121	46689	L3
L2	(line$ with scan$ with (imag$ or camera)) and @ad<=20031121	61194	L2
DB=PGPB,USPT; THES=ASSIGNEE; PLUR=YES; OP=OR			
L1	20010056326 or 6473678.pn.	2	L1

END OF SEARCH HISTORY

Refine Search

Search Results -

Terms	Documents
L2 OR L3	38

Database:
US Pre-Grant Publication Full-Text Database
US Patents Full-Text Database
US OCR Full-Text Database
EPO Abstracts Database
JPO Abstracts Database
Derwent World Patents Index
IBM Technical Disclosure Bulletins

Search: 10/059007

Refine Search

Recall Text Clear Interrupt

Search History

DATE: Sunday, June 03, 2007 Purge Queries Printable Copy Create Case

Set Name side by side	Query	Hit Count	Set Name result set
	DB=PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD; THES=ASSIGNEE; PLUR=YES; OP=OR		
L4	L2 OR L3	38	L4
L3	(((SHORT$ ADJ MESSAG$ ADJ SERVI$) OR "SHORT-MESSAGE-SERVICE" OR SMS$) WITH (DATA OR MESSAGE$)) AND (DEVIAT$ WITH (ROUTE OR LOCATION OR ADDRESS$ OR PLACE)) AND NAVIGAT$ AND (SHORT$ WITH (DISTANCE OR LENGTH$ OR WAY$ OR ROUT$)) AND @AD<=20020130	19	L3
L2	(((SHORT$ ADJ MESSAG$ ADJ SERVI$) OR "SHORT-MESSAGE-SERVICE" OR SMS$) WITH (DATA OR MESSAGE$)) AND DEVIAT$ AND NAVIGAT$ AND (SHORT$ WITH (DISTANCE OR LENGTH$ OR WAY$ OR ROUT$)) AND @AD<=20020130	38	L2
L1	(SMS WITH MESSAGE) AND NAVIGAT$ AND @AD<=20020130	661	L1

END OF SEARCH HISTORY